

**TFM**



**Traffic Flow & Enterprise Management**  
**Integrated Product Team**

**FAA**  
**AUA-700**

# Departure Spacing Program (DSP)



Linda LaBelle, DSP Product Lead, AUA-730  
8 November 2001

<http://www.faa.gov/aua/aua700/default.html>

**Traffic Flow & Enterprise Management**



# Purpose of Briefing

- Provide briefing on current status and usage of DSP, near term plans for expansion, and applications for departure flow management



# DSP Overview

- Prototype research and development (R&D) and proof-of-concept initiative
- Designed to help reduce inefficiencies and delays associated with departure spacing and sequencing
- Currently in operation at 10 New York area ATC facilities and the ATCSCC
- DSP NE Corridor expansion planned for Spring '02 at additional 9 Washington area and 6 Boston area ATC facilities



- The primary system goal of DSP is the efficient coordination of departure traffic from airports within the Northeast Corridor, especially during Severe Weather Avoidance Procedures (SWAP) events, by providing automated tools to help controllers perform their duties and to assist traffic managers to regulate/manage sector workload



# DSP Goal Accomplishment

- DSP meets this goal by ensuring that the number of aircraft controlled at any one time is within a predefined level of system capacity
  - Controllers review and ensure correct flight plan routings
  - DSP regulates departures through the scheduling of departure releases at adapted airports so resulting demand at departure flow fixes does not compromise prevailing fix flow rates



# DSP Scheduling

- DSP calculates departure schedules by coordinating the release of departures from multiple airports to produce a level of demand that can be managed by controllers as departure traffic converges on common departure flow fixes
- This is accomplished by using fix flow rates, Minimum Window Sizes (MWS), and Minimum Window Flight Counts (MWFC) to regulate sector controller workloads
- These parameters control the total number of aircraft (per hour) cleared to a fix and the distribution of those aircraft over time
- Fix flow rate, MWS, and MWFC are set on a per fix basis so that variations, such as sector complexity, weather, or differing levels of traffic volume, may be accommodated



## DSP Scheduling (cont.)

- Using DSP, controllers and TMU specialists at ARTCCs, TRACONs, and ATCTs at adapted airports are provided with airport departure schedules for any runway or complex of runways. Airport departure schedules takes into consideration:
  - Departures from multiple airports converging on common departure flow fixes
  - Flights which have received Estimated Departure Clearance Times (EDCTs) from the ATCSCC to implement a national delay program
  - Controlled Departure Times (CDTs)
  - Imposed restrictions on departure flights by adjacent ARTCCs
  - The number, departure status, and location of flights contending for the same runway
  - Current airport conditions (current airport runway configuration, departure rates, etc.)
  - Airport priority
  - Fix Flow rates

The graphic features the text 'TFM' in blue and 'EM' in green, with a stylized aircraft icon in blue and white. The aircraft is depicted in flight, angled upwards and to the right. The background consists of horizontal stripes in yellow, orange, and blue.

# How DSP is Used – ARTCC TMU

- Monitor overall demand in the ARTCC
- Specify fix flow rates
  - Free flow of departures until adapted fix demand requires intervention
- Modify ARTCC system parameters for DSP fixes, i.e., flight postable parameter time, drop intervals
- Regulate traffic flow over DSP adapted fixes by applying fix restrictions
- Monitor DSP system communications



## How DSP is Used – TRACON TMU

- Function as intermediary between airport and en route airspace
- Monitor and evaluate overall throughput of airports within TRACON's jurisdiction
- Coordinate with ATCT for appropriate departure rates for the airport
- Suggest fix flow updates to ensure coordinated flow over departure fixes



# How DSP is Used – Dept Complex

- Stripless environment
- Monitor flights in active lineup status
- Enter flight plan information
- Revise flight “Clearance Status Indicator” values
  - Cleared as filed
  - No route available
  - Revision number
  - No assignment
- Issue preferential routes and SWAP route amendments
- Issue aircraft releases



# How DSP is Used – ATCT

- Monitor flight data departure information and make DSP inputs to specify each flight's current departure status
  - Input and issue clearance delivery for flights
  - DSP considers flight for DSP scheduling
  - Issue gate holds
  - Issue pushback clearances
  - Input taxi start times and adjust taxi sequence to DSP departure schedule
  - Adjust final lineup sequence as necessary



# DSP Operational Benefits

- Evaluates aircraft departure flight plans at airports
- Optimizes clearance/taxi/lineup and departure sequences by forecasting projected aircraft demand at departure resources (departure fixes, runways)
- Provides controllers with windows of departure times
- Replaces paper strips with electronic flight departure strips
- Provides near real-time electronic information exchange, thereby reducing use of interphone voice communications and reducing time needed for coordination
- Ensures maximum resource utilization during transition to the enroute domain, especially in deteriorating weather



# Situational Applications for DSP

- Holding departures due to fix saturation from severe weather
- Adjusting adjacent ARTCC departures to fit into local ARTCC's departure streams
- Securing releases from adjacent controlling sectors and facilities
- Establishing appropriate reroutes for delayed aircraft when matched against a dynamic weather system and changing traffic flow demands



# DSP History

- Initial Daily Use at seven NY-area facilities in April 2000
- Numerous functional enhancements in accordance with Eastern Region/NATCA work group requirements
- Initial Daily Use at additional three NY-area ATCTs in March 2001
- Boston ARTCC Phase 1 implementation – July 2001
  - Allows ZBW to view ZNY DSP data
  - Allows ZNY to enter ZBW departure flight data



# DSP Current Facilities

- DSP is installed and currently in operation at the following locations:
  - New York ARTCC (ZNY)
  - New York TRACON (N90)
  - LaGuardia ATCT (LGA)
  - Kennedy ATCT (JFK)
  - Newark ATCT (EWR)
  - Philadelphia ATCT & TRACON (PHL)
  - Islip ATCT (ISP)
  - Teterboro ATCT (TEB)
  - Westchester County ATCT (HPN)
  - ATCSCC
  - Boston ARTCC (Phase 1)



# DSP Future Activities

- Expand prototype system and capabilities to the greater Boston and Washington metropolitan areas
- Create DSP Integration & Operations (DIO) Laboratory at WJHTC to allow modeling/simulation of DSP facility interaction
- Provide capability for DSP facilities to coordinate departure flight data across ARTCC boundaries
- Provide common situational awareness of NE Corridor departure flow among ARTCCs and ATCSCC
- Provide capability to allocate departure delays among facilities
- Evaluate prototype for potential technology transfer to TFM infrastructure and expansion beyond NE corridor



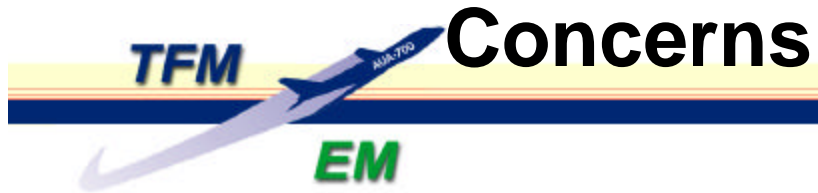
# DSP Northeast Expansion

- |  |              |
|--|--------------|
| – WJHTC DSP Integration & Operations (DIO) Lab | January 2002 |
| – Washington ARTCC (ZDC)                       | March 2002   |
| – Washington Dulles ATCT (IAD)                 | March 2002   |
| – Washington Reagan National ATCT (DCA)        | March 2002   |
| – Baltimore Washington ATCT (BWI)              | March 2002   |
| – Andrews AFB ATCT (ADW)                       | March 2002   |
| – Boston ARTCC (Phase 2 - full) (ZBW)          | April 2002   |
| – Boston Logan ATCT (BOS)                      | April 2002   |
| – Windsor-Locks ATCT (BDL)                     | April 2002   |
| – Providence ATCT (PVD)                        | April 2002   |
| – Manchester ATCT (MHT)                        | April 2002   |
| – Potomac TRACON (PCT)                         | Summer 2002  |



# Northeast Corridor Operational Concept

- Initial Capability
  - Independent scheduling engines (3 stand alone systems)
  - Manual coordination of fix flow rates between ARTCCs
  - ATCSCC participation limited to maintaining common situational awareness
- Future Capabilities
  - Increased automated coordination among ARTCCs and ATCSCC for determination/setting of boundary crossing flow rates and departure airport weighting
  - Expanded capabilities for ATCSCC to coordinate and manage decisions on flow capacities for aircraft departing the Northeast Corridor
  - Integrated scheduling engine(s) for the three areas



- Aggressive Implementation Schedule
- NATCA Memorandum of Understanding



# Operational Concept Definition

- Work is ongoing to develop procedures for coordination within and between facilities
- Define role of ATCSCC in an integrated system
- DIO Lab will allow simulation of new traffic flow management scenarios and techniques, operational procedure development, analysis of “what if” situations
- Air Traffic Manager of Tactical Operations (ATT-4) for Northeast Corridor (AEA/ANE) has initiated planning and definition work



# DSP Contact Information

Linda LaBelle, DSP Product Lead, FAA/AUA-730

- 703-326-3837 Work
- 703-507-1871 Cell
- [linda.labelle@faa.gov](mailto:linda.labelle@faa.gov)